



TECAPET and TECAPET TF

Optimum machine processing: Increased toughness reduces disruptions

[Hä] The increased requirements in the machining of precision components place high demands on the processing properties of materials. With TECAPET, ENSINGER has introduced a polyethylene terephthalate to the market which has been optimised for precision machined parts, e.g. in the semi-conductor field and in all mechanical engineering applications. The primary aims of the development were the machine shops' interest in making full use of their highly efficient CNC machining techniques and to continually increase their working speed. The tough behaviour of PET is therefore a decisive or criterion. Under extreme circumstances,

TECADUR PET, with its harder and stiffer properties, was prone to breakage. However, with the impact modifications of TECAPET, the requirements of machine shops' are fully achieved.

TECAPET is impact resistance with a high degree of hardness and rigidity, very creep and abrasion resistant, has extraordinary dimensional stability and is true-to-size, as well as having good electrical insulating properties. The material is very resistant to oils, grease and acids, is dirt resistant and stable to radiation. TECAPET is classified according to UL 94 HB and, in comparison to polyamide, does not change in its properties due to moisture uptake.



High degree of toughness prevents chipping and disruption during machining. Comparison of machining result between TECADUR PET (left) and TECAPET (right).

More recently, an additional self-lubricating TECAPET TF with PTFE modification has also become available which, in addition to the above-mentioned properties, is highly abrasion resistant and is especially suitable for gliding-rubbing applications. TECAPET and TECAPET TF find application in nearly all branches of industry: in electrical engineering and electronics, e.g. for switches, plug connectors, sensor casings and

contact strips, in transport and conveying technology for guide rails, sliding rails and bearings, cam discs, cam rollers and gripping devices, in automobile technology for casings, windscreen wiper arms, door handles, friction rings, or in medical technology for functional parts in medication dosing systems. TECAPET is available in the colours black and white, TECAPETTF in grey. ENSINGER supplies sheets and tubes in many different dimensions.

Focusing on the industrial side of research

WAK Working Group meet at ENSINGER

[Hä] Following an invitation by ENSINGER GmbH, the university professors amalgamated in the scientific working group for plastics technology (WAK) met on 10th and 11th July for their 12th working group meeting in Nufringen.

Today, the WAK consists of 23 professors who between them represent the extent of field of plastics technology with their research profiles. The working group is trying through improved coordination of the research work of its members and by a stronger commitment of industry and the public sector to the area of sponsorship of plastics technology to take into account the strongly growing economic and technological significance of plastics technology.

Wilfried Ensinger has supported the WAK for five years now through the donation of the Wilfried Ensinger Prize, which is awarded every year. The visit to Nufringen offered the scientists the opportunity to discuss directly with developers from industry and to learn about further

new approaches. During a joint evening meeting, guests, members of the executive board and further representatives of ENSINGER GmbH were able to exchange views about current issues and to focus once more on the industrial side of their research.

"We are pleased to have numerous contacts to the members of the working group and also about the active exchange of ideas during this meeting", said managing director Klaus Ensinger in his short address.

On the second day, Klaus Ensinger and Dr. Roland Reber presented the working group with ENSINGER's full range of products and application developments, followed by company orientation, current product and application developments. Finally there was a guided tour through the factory during which ENSINGER staff were available to answer questions from the guests and discuss approaches for further collaboration. A joint lunch marked the close of the meeting.



The WAK working group met at ENSINGER in Nufringen.

Application: Vespel® parts for welding and cutting torches

Prolongs the life of the product

Vespel® is increasingly being used in welding and cutting when an electrical and thermal insulator is needed for MIG/MAG, WIG and plasma.

Dimensional stability to heat, creep strength and flexibility are the properties which give diffusers made of Vespel® a much greater service life than their predecessors made of ceramic material, which partly require more effort for maintenance and repair (quite often during these repairs the diffuser suffers additional damage).

Vespel® has a permanent working temperature of 300°C and shows no thermal damage even after short-term exposure to temperatures up to 480°C. Due to the heat-resistant surface of the Vespel® part, welding splatter pearls off to a greater extent and leaves no traces of burning.

The material has very good electrical properties. Due to its chemical structure and resultant thermal stability, the danger of arcing due to decomposition of the material is far less than e.g. with fluoropolymers.

A further advantage of Vespel® is that creep, which is well-known with plastics, can be reduced to a considerably low characteristic value. Thanks to the optimum cutting properties, the more flexible polyimide

part can be produced with less play than ceramic parts, which leads to better sealing of the copper nozzle of the cutting torch.

The flexibility and elasticity of the material mean the highest possible service life due to the lower impact sensitivity and the non-existent danger of breaking, especially during the above-mentioned repeated repair work.

In this way, Vespel® polyimides offer many advantages and are being used more and more in the welding industry due to the increased requirements placed on materials and longer maintenance intervals.

Vespel® comes in the form of rods, sheets and tubes, which are available ex warehouse at short notice (1-2 days). Short-term delivery times reduce inventory costs and also mean short availability times. Because of the very good machine cutting properties (comparable to brass), complicated geometries are possible which provide a very high degree of tightness at the nozzle with the closest of tolerances. In the case of applications in series – over 1000 items – a tool-bound process for manufacture of parts is possible.

Bernhard Binder-Reisinger,
Applications Adviser for Vespel®

Dear reader,
from this issue on, in the "impulse", we will selectively represent the news from the individual product units.
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Diffusers made of Vespel® for a longer service life of cutting torches.

Editorial



Dear Readers,

Basle II, corporate governance, supplier and customer ratings – this is the beginning of a whole new list of issues which German companies are being asked to address – often quite reluctantly. But looking at this a pointless exercise of overzealous EU bureaucrats falls too short. The regulations are supposed to put a third party in a better position to judge the risk associated with a particular company. There was and still is enough reason to make provisions for risk, as current examples show. In this sense, at ENSINGER we are trying to do justice to our respective responsibilities. Our partners – clients, suppliers, representatives of banks

and insurances – all confirm that we are coping with the challenges presented by risk management. As useful as this development towards consciously and systematically controlled risk is: it does have hidden dangers. This is the case when guidelines, risk analyses and risk scenarios lead to precious ideas not being adopted and innovations are not given a push. New ideas always hide the unknown and potential danger. And with the wish to eliminate all dangers beforehand, innovations that we so urgently need are easily stifled. We can see the results of such policies in Germany (which obviously correspond to the will of a wide section of the electorate). Genetic engineering, biotechnology, pharmaceutical research and nuclear technology are disciplines which have their foundations in Germany, but are hardly pursued in

this country anymore. The consequences with regard to jobs and prosperity will be serious. But that which we are blaming here on politics is also to be found at a company level. With manic controls, a bureaucratic jungle and wrangling over rights and competencies, anything which merely hints at being new and irksome is thwarted. But tomorrow we will all be living off the “young” plants, which have not been trampled on today. This is why we all have to stand up for an environment which allows the new and promotes it. An environment of innovation not only provides more happiness than one of prohibition and demarcation, it also strengthens genuine awareness about risks and proper precautions. Whoever wishes their product or project to be successful should think of the side effects right from the start.

I often have the chance to discuss with innovative business partners their ideas about making changes and I try to feel the spirit which could make these developments possible. Over and over again principles arise which we at ENSINGER feel obligated to – trust in the competence of our employees, freedom to act, open communication, honesty with one's self and the absolute will to make changes. The nice thing about it is that we can also attribute such a culture to many of our clients. If we can manage together to uphold such a culture even in critical times, I am not afraid about the future of our industrial location.

Yours sincerely,


 Klaus Ensinger

Business Unit Building Products

insulbar® Prototyping: Sample profiles after 4 days

[Wey] Using insulbar® prototyping, it is possible to manufacture identical mass produced profiles with simple geometries after only 4 days. Profiles with complex geometries, e.g. hollow chamber profiles, can be supplied after only 10 days. Despite the considerably shorter development and production times, no compromises are made with regard to the quality of the sample profiles: this is already so good that the profiles obtained from the insulbar® prototyping process can be tested and used practically without restrictions. insulbar® prototyping was developed for faster and safer manu-

facture of sample profiles. In this way, the Building Products Division of ENSINGER GmbH actively supports customers and business partners in the development of new systems, especially bearing in mind the need for ever shorter development cycles. From the first public presentation at the BAU fair in January, the process has already generated much interest from various parties which has resulted in many projects being realised. More information about the prototyping process, you can get from Sig-hart Ulmer: Tel. +49 (0) 7032 819-117.



It depends on the Ψ value!

Thermix® spacers are crucial for the “warm edge”

[Wey] Within the last years, the thermal insulation of windows could be considerably improved. Coatings and gas fillings have contributed a great deal and also the frame construction was thermally improved. Following this development the focus of attention was moved to the insertion of the glass into the frame of the edge bond of the insulated glass.

In these areas the window always had a weak point concerning heat transition; there was a so called thermal bridge. This thermal bridge is characterized by the linear heat transition coefficient, the Ψ value, and included in the calculation for the U value* of a window.

Compared to “conventional” insulation glass edge bond (aluminium spacers), the consideration of the thermal bridge between window glass and frame with the help of the Ψ value increases (makes worse) the calculated thermal transmission coefficient of a window by 0,2 W/m²K from 1,2 W/m²K to 1,4 W/m²K.

This effect will only become clear with windows with good thermally in-

ulating frame construction and with thermally insulating glass.

To oppose to this deterioration, ENSINGER has developed the so called “warm edge” spacers. Compared to insulating glass with regular aluminium or steel spacers, Thermix® spacers break the thermal bridge at the transition between the glass and the frame.

With a thermally improved edge bond out of Thermix® spacers, the interior glass surface remains warmer at the edge of the isolating glass (therefore: “warm edge”) and so, there is virtually no danger of condensation formation leading to damage and mould, which can be a health risk.

The window remains dry and so it contributes to a healthy climate in the room. In air-conditioned buildings, the energy requirement for cooling is reduced and heat can better be kept outside the building.

The Ψ value is not constant but it depends on the following factors:

1. (Heat) conductivity of the material
 2. Depth of the glass' incorporation within the frame
 3. The Uf value of the frame (refers to the frame area of the window without glazing)
 4. Type and material of the frame
- You can get further information on Thermix® spacers from our office in Ravensburg: +49 (0) 751 35452-0, and on the internet under www.thermix.de

*U value: The previous designation, the “k-value”, has been replaced by the “U value”. It gives the amount of heat that is transferred per unit of time through 1 m Ψ of a component with a temperature difference between the adjoining room air and the outside air of 1 Kelvin. The lower the U value, the greater the heat insulation. The U value for windows (Uw) now also describes the heat losses through the composite insulation glass.

insulbar® insulating profiles now speak Russian

[Wey] Recently, the insulbar® homepage (www.insulbar.com or www.insulbar.de) was expanded to include a Russian translation. The consistent extension of the online offers of insulbar® will continue. Beside further additional languages, the content is continually expanded and updated.

all those sales departments directly involved in logistical functions. Specific needs of customers and countries were analyzed and successfully transferred to the optimized logistical system. With delivery service rating of 96 % at present (measured from the current production) ENSINGER even could exceed the expectations.

“Logistical offensive” very successful

[Wey] Last year, the Business Unit Building Products started their optimization program for logistics. The ambitious aim was to further increase the delivery service rating and reach a level of at least 95 %. The optimisation process embraced



Brings your profiles just-in-time: the insulbar® truck.



“Exceeding customer expectations”

Interview with Wolfgang Schwab



Wolfgang Schwab has been at ENSINGER for almost two years now. Currently, he is head of the Service Center Plant and Technical Services, which was newly structured after the succession of Mr. Hess.

After studying mechanical engineering at the University of Karlsruhe, he worked at Robert Bosch GmbH in Bühl and was in charge of repair work. He was also able to gain experience with several start-up projects (A-class and S-class) in the automobile industry as head of production and operations at Johnson Controls.

“Plant and Technical Services” sounds very extensive. Which assignments and areas does this actually cover?

Essentially, these are the areas of tool making, technical services/plant and buildings/real estate. In tool making, we look after all areas of production at ENSINGER. This ranges from injection moulding tools to construction profiles in Cham and extrusion in Nufringen, USA and Brazil. Thus, we are able to cover the entire tooling spectrum of the company, which naturally means that a high degree of flexibility with the facilities but also with the employees is a prerequisite. In the machines and equipment construction area, a large part of the internally planned and constructed machines and equipment are assembled and put into operation. The electrical equipment department and the machine shop supply components, switching cabinets and controls, which have to be adapted according to the flexible requirements of the factory. Furthermore, plant in use in production has to be maintained and repaired, which is only possible with great commitment and expertise. Without teamwork in these areas, it would not be possible to do what we do with our relatively small team.

My third area of responsibility is the management, planning and upkeep of buildings. Once again, employees from the machine shop and electrical equipment department are involved here. Whether alterations, extensions, moving or new construction work, we try to utilize our capacities and carry out the usually short-term activities as quickly as possible.

Although one normally associates building utilities with electrical points, window cleaning and gardening, our most important task is to provide a reliable source of the energy and media requirements in the production area around the clock. A very high level of importance is placed on this responsibility, as more recently we have experienced big problems with production processes e.g. after a thunderstorm, with breakdowns in the supply of electricity and cooling water. For this reason, it is necessary that employees who are on call especially at night can reach the company quickly in order to restore these utilities.

Since mid-year, the vehicle pool and freight handling has also been added to the previous responsibilities of the organisational management of company vehicles. Furthermore, the responsibilities supply of media e.g. gas and hazard-

ous materials and waste management have been added.

If we consider the term technical services again, the Service Center offers all services concerning buildings and processing facilities at ENSINGER in Nufringen.

What was your first project?

The first big project at ENSINGER was the new warehouse for injection moulding. Despite the unfavourable shape of the property, we were able to make optimal use of the area after intensive discussions with the community, the district council and the German Railway. Many people have been interested in the unusual shape and have made a trip to see us in the industrial area.

I also found it a success that we were able to hold an end-of-year celebration for all Nufringen employees together with the completion of the building.

What has been your greatest challenge up to now?

After my predecessor Mr. Hess left and shortly thereafter Mr. Secker, we have made some organisational changes. In the meantime, the management team in the area of tooling construction has been supplemented by Mr. Bernhardt Haid for the complex needs of injection moulding, and the team of the electrical equipment department, machine shop, machines and equipment and building utilities has been complemented by Mr. Herrn Werner Buschek. It was important to me when choosing these colleagues to find people who, in addition to the expert requirements, also fit into this flexible area and who can achieve a high employee and customer satisfaction with their leadership by motivation and team building.

How do you keep track of things with such a large team?

By staying in contact with all the key functions. We have regular meetings in the main areas, where we mutually agree on planning, changes and problems and work on solutions.

Staff carry a big responsibility regarding the required high flexibility, as decisions cannot always be discussed in advance. However, in my opinion the high degree of freedom makes these jobs very interesting and varied. Especially with larger building projects, it is absolutely necessary that we can rely on each other.

Are you just responsible for Nufringen or also for Cham?

We have close contact to Cham, especially via the tooling department, where we can mutually help each other out. Production facilities are also built for Cham by the machines and equipment department in Nufringen. Repairs, management of production, building projects, and building utilities are looked after separately at each location. However, I would like to promote more strongly a greater exchange of information in the individual areas in the future.

How is the collaboration with the other ENSINGER divisions?

We see the divisions and Service Center as our customers and therefore have close contact to all departments on site.

Whether in the construction of tooling or drawing up plans for a new production area, the procurement of technical accessories or replacement parts to overhaul and optimise extruders, we are always at the service of the customer. If we succeed in future to stay one step ahead of the customer, then we have done our job properly.

At a previous employer we adopted the motto: Exceeding customer's expectations. I would also like to fulfil my responsibilities at ENSINGER with this objective in mind.

Team training at ENSINGER France



Rainer Gottschalk from Business Development visited the subsidiary UMP in France in May. At a training meeting with employees he was able to intensify their knowledge about the new products in the ENSINGER portfolio (TECAMAX SRP, TECAPET TF and the new vacuume forming materials). Following this, Mr. Gottschalk visited selected customers together with French colleagues and introduced them to the new materials.

Fair Dates

13th – 15th September 2005:
GlassBuild America, Atlanta

For the first time, the Glass Build America, one of the most important fairs of the window and glass market in Northern America will take place in Atlanta.

The Building Products unit will present a broad range of the product lines insulbar® insulating profiles for metal windows, doors and facades as well as Thermix® warm-edge spacers and bars. Visit us at Stand 431.

27th – 30th September 2005:
Motek, Sinsheim

ENSINGER will be participating at this year's MOTEK, the international specialized trade fair for assembly and handling technology to be held in Sinsheim.

Emphasis this time will be placed on presentation of the new plastics TECAMAX SRP, TECAPET TF and the new added range of deep-drawing materials. Our application advisers will be delighted to help you.

The MOTEK fair is open between 27th & 30th September, so please come to visit us at our usual place: Hall 3, Stand 3126.

Prize competition

In the last “impulse” we asked for the sum which was spent for the flood victims. The correct solution was “22,000 Euros”. The prizes (SIGG drinking bottles) went to

Karl Süß, JUMO GmbH & Co. KG
Gerold Schmidt, Brose GmbH & Co. KG
and Rainer Hummel, ENSINGER GmbH

Congratulations!

The question for the current prize competition is:

What does the so called Ψ-factor stand for?

- a) The distance between window glass and frame?**
- b) The heat loss in degrees Celsius?**
- c) The linear coefficient of heat transmission?**

Send the answer by e-mail to impulse@de.ensinger-online.com.

The closing date is 1st October, 2005.

Win one of three ENSINGER USB sticks – Good luck!



“Current Law”

According to new contract law, the question of whether a deficiency exists in a purchased article can be answered by asking what expectations the manufacturer has awakened in the customer with respect to the advertising. Logically, the higher district court in Munich agreed with the purchaser of a car in the case in question. Due to a technical change, the purchased automobile could only be run on super grade petrol. The manufacturer's brochure explained that the car could be filled with regular grade petrol. The purchaser claimed that the car was deficient, as regular grade fuel is cheaper, as is well known.

An advertising brochure of a car manufacturer represents a public statement of a manufacturer in the sense

of Article 434 paragraph 1 clause 3 BGB (German code of civil law). If the expectation awakened in the purchaser does then not apply, a material defect can be justified. In addressing the issue of suitability for customary usage, which is to be established objectively as a matter of principle, it has to be set down which condition the purchaser can expect. This is determined according to the level of expectations of the average purchaser. According to Article § 434 paragraph 1 clause 3 BGB, advertising claims and other public expressions of the manufacturer concerning certain properties of the product extend the actual condition of the object by the characteristics which the manufacturer has promised. If the manufacturer promises a lot but does not keep it, then a material defect exists. *Achim Lehmann, lawyer*

Business Unit Semi-finished Products

Semi-finished goods inventory levels extended

[Hä] ENSINGER has clearly extended its portfolio of semi-finished goods once again and is thus increasing the benefit of its products to customers. The new material TECAPEEK Classix is now available in many rod dimensions from 6–40 mm. The portfolio of tubes made of TECA-

PEEK and TECAPEEK PVX has also been extended. The range of TECAPEI, TECATRON PVX and TECASON P sheets has also been extended and TECAFORM AH tubes are now available from stock in many new dimensions with immediate effect.

Ask your contact person for details or write to info@ensinger-online.com – or simply consult our newly installed stock register on our website www.ensinger-online.com

Mike Petschke

New technical adviser for semi-finished goods applications

Since May, Mr. Mike Petschke has reinforced the department "Marketing Technical Services" as the successor of Mr. Gerhard Lichtenberger, who is now enjoying his well-deserved retirement. He is available to answer technical questions from customers and ENSINGER employees at home and abroad and advises them on the use and processing of engineering plastics. Mike Petschke studied materials and process engineering and specialised in polymers. Afterwards, he worked as an applications engineer in the field of acrylic glass and polycarbonates, then as a technical sales adviser in the rubber industry and also as an applications engineer for pharmaceutical primary packaging.



How is cooperation with the subsidiaries?

I have already visited our German and Austrian branches – the aim was more to get to know each other. Due to the high level of expertise available in our subsidiaries, this is likely to be an exception, however. Naturally, our worldwide subsidiaries receive all the assistance they need in matters regarding technical service – because that is, after all, how our customers' needs are satisfied.

What do you like about ENSINGER? How do you see the plastics industry developing?

What I like about ENSINGER is the wide range of plastic materials being offered – starting with common materials like polyethylene and polyamide right up to the high performance plastics such as PEEK or the polyimides. However, it is not only the different kinds of polymers but also the different processing possibilities which are offered which provide the variety and the fascination of this company.

Aside from all the enthusiasm about the numerous polymers and processing options, there is another very important aspect not to be neglected – the collegiality as it is not only propagated but lived at ENSINGER; unfortunately, this has become very seldom these days.

... and what do you do in your free-time?

My hobbies are electronics, astronomy and cycling, the latter admittedly without any sporting ambitions...

New tools on the website: Current range of semi-finished goods now online

[Hä] With immediate effect, the most up-to-date data on the semi-finished products delivery programme is available online on the company website. In this way, new articles in stock can be seen immediately and customers will not have to wait for the printed catalogue in order to be informed about new product dimensions.

Data sheets on individual materials, which have already been used and

recalled actively since the service was introduced, are generated anew and kept up-to-the-minute by a data bank each time they are called up. This means that test values which have been recently added can be seen immediately for those interested and the data sheets are always current.

For both types of inquiry there is a practical innovation: The respective opened pages can be converted into PDF documents by mouse click. The document is given an attractive layout and can be saved, printed out or sent as you wish.

Just click onto our site and try it out: www.ensinger-online.com

Where will your place of work actually be? And what exactly is your assignment?

I will be able to manage most of my job from my office in Nufringen. I will work on enquiries concerning the properties and possible applications of the extensive range of ENSINGER polymer materials. If required, I will also visit our customers directly together with colleagues from sales – as very often problems arise quite suddenly, which have to be checked out and solved on the spot due to the close association with the application in question or the production process.

Customer training: Seminars all about subject of plastics

[Hä] For over two years, organised customer training sessions have been part and parcel of ENSINGER's range of services: interested parties can participate in a one or two day seminar dealing with topics all about plastics and their applications.

The seminars provide comprehensive information in the theory and practice of the structure and application of plastics. The freely variable modules can be adapted to individual wishes and the existing knowledge of the participants. Lecturers are application engineers from the areas of Marketing Technical Service and Business Development. The aim of these meetings is to make

qualified, satisfied users and loyal customers out of purchasers.

Interested? Contact our project manager Mr. Peter Bongardt on p.bongardt@de.ensinger-online.com



During the customer training meetings in July in Nufringen, employees attended from the company Telle in Nürnberg and Bayreuth to improve their knowledge and skills in the field of engineering plastics.

And last but not least: ESRO's building complex gets a "facelift"

Apart from a new logo above the entrance, and being painted a year ago, the ENSINGER Czech building remains the same as it was when first built nearly nine years ago. However, during one of the regular training sessions arranged by ENSINGER, the sales and production team came up with an excellent idea: "We want to facelift our building with flags!" Petr Sobas was appointed project manager, and after some necessary preparation an invitation – "We are hoisting the flags" – was issued for the 17th

June 2005 for a small company celebration. Both shifts from the production and sales teams attended the occasion. One question which required several hours of debate was which flags should be flown everyday; the team settled on the EU flag between company flags. Coordinating such an operation needed a professional, so the company's authorised signatory, Mr Habart, undertook the task of handling the EU flag, whilst directing the EU flags to be raised by Mr Sobas and Mr Svehla. Everyone

participated as can be seen by the first photograph, and it also shows how well coordinated the sales department are as a team. The fact



that Mr. Sobas was slightly "ahead" of everyone else can be attributed to his young age. Otherwise everything went fine. After the installation, everyone gathered in the canteen where light refreshments had been prepared. It was really a small investment which had a great effect: Not just the team spirit generated by our two departments, but also displaying our membership to the European house and to the European ENSINGER Group.

Richard Sulko

Impressum

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